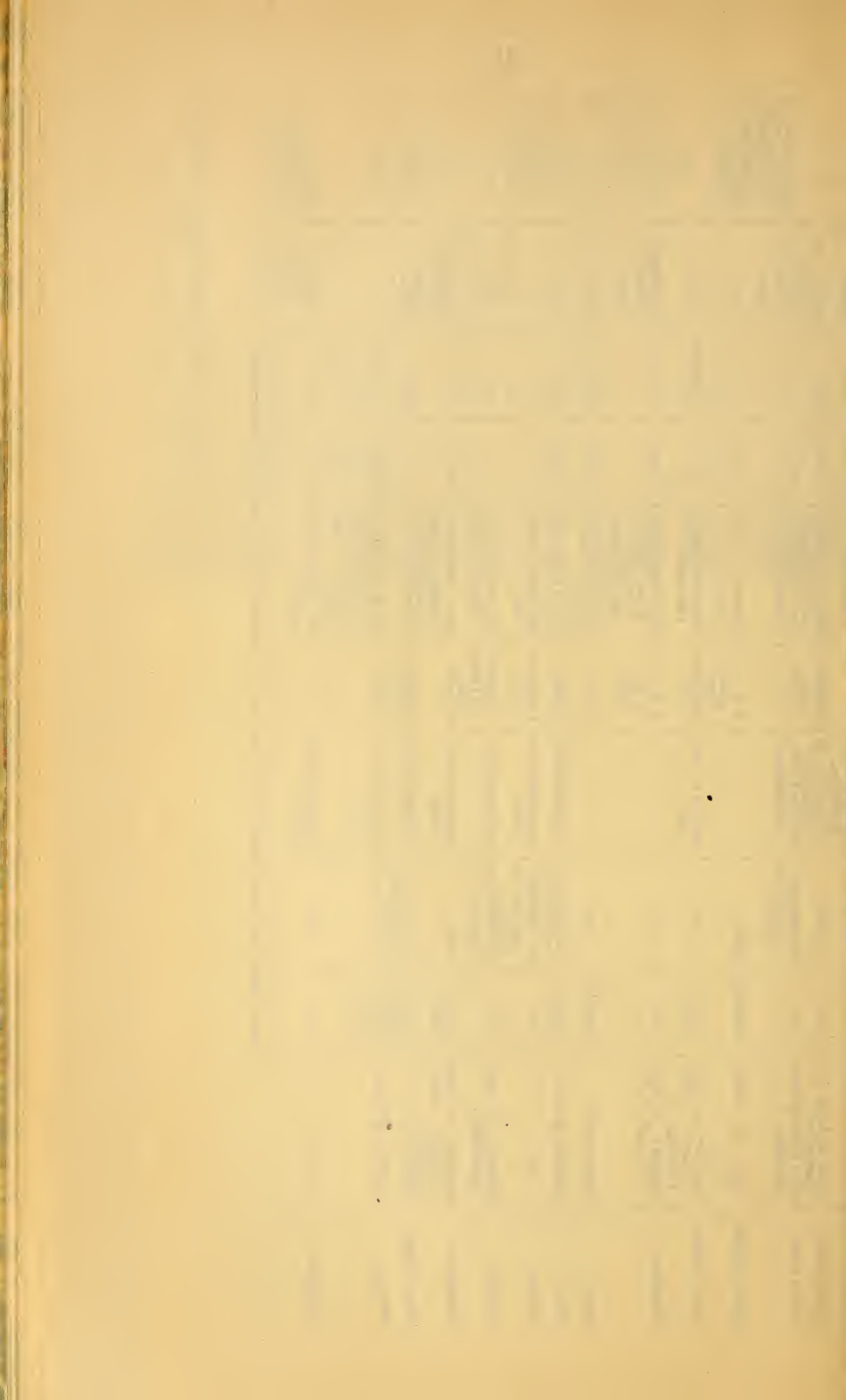


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United States Department of Agriculture,

OFFICE OF THE SECRETARY—Circular No. 74.

STATE HIGHWAY MILEAGE AND EXPENDITURES FOR THE CALENDAR YEAR 1916.

(Prepared by the Division of Economics, Office of Public Roads and Rural Engineering.)

Cash expenditures on the rural roads and bridges in the United States in 1916 amounted to \$272,634,424. To this should be added the value of the statute and convict labor, which can not be fixed with any great degree of accuracy, but probably amounted to not less than \$15,000,000, thus making the grand total expenditure for the year \$288,000,000. This total is made up of the actual expenditure for such items as labor, materials, supervision, management, and administration directly connected with the construction, improvement, and upkeep of our public roads and bridges.

This, however, does not represent the total outlay by the States and communities because of their rural public roads. At present there are outstanding more than \$400,000,000 of road and bridge bonds and long-term warrants, maturing at the rate of about \$20,000,000 per year and requiring about an equal amount for the payment of interest charges.

The full extent of this bond burden, however, is impossible of any exact determination. More than \$40,000,000 of new road and bridge bonds are now being issued annually. Furthermore, general bonds are issued in many cases to cover actual or threatened deficits occasioned wholly or in part by the road and bridge expenditures. Outstanding road or bridge bonds or warrants often are taken up by general refunding bonds and the identity of the bonds as pertaining to road work thus lost. Such data as are available, however, serve forcefully to call attention to the abuses to which the bond method of financing often is being subjected. To issue bonds for the financing of road improvements frequently is both advisable and necessary. But this does not justify some of the present-day practice. Millions of dollars' worth of road bonds having a term of 30 years or more still are being issued every year, and one State has gone so far as to legalize and encourage the use of bonds having a term of 41 years for the financing of local road construction. This all too frequent practice of issuing long-term bonds in payment of improvements which can not possibly last one-half of the term of the

indebtedness can be defended neither on the grounds of sound public policy nor of good business. It should be discontinued at once.

From 1904 to 1915, inclusive, the annual increase in the expenditures on rural roads and bridges amounted to approximately 12 per cent over each preceding year. The increase of 1916 over that of 1915, however, was only 2 per cent. This was due largely to the scarcity of labor and materials which caused an unusually large number of contracts to be carried over to this year. In New York State alone, contracts involving about 900 miles of State and county highways were left uncompleted at the close of 1916.

The movement for State aid and more centralized control in the management of public roads which first received definite status with the passage of the New Jersey State-aid bill in 1891, and has been practically continuous ever since, received a further impetus and still wider recognition in 1916 with the passage of the Federal aid road act, approved July 11. This act authorizes the Secretary of Agriculture to cooperate with the States, through their respective State highway departments, in the construction of rural post roads. The particular roads to be improved are selected by the State highway department of each State and approved by the Secretary of Agriculture. For carrying out the provisions of this act, Congress appropriated \$75,000,000, of which \$5,000,000 is made available for the fiscal year 1917, and a sum increasing annually by \$5,000,000 for each of the following years until 1921, when \$25,000,000 will be available. Three per cent of the appropriation is available for administration and overhead expenses, and the remainder is apportioned to the several States on the basis of population, area, and mileage of rural-delivery routes and star routes, each having a weight of one-third. The State must pay at least one-half of the cost of all the roads improved from Federal aid, and in addition, it, or its civil subdivisions according to its laws, must maintain these roads after they are constructed. Under the same act \$1,000,000 a year for 10 years is appropriated for the construction and maintenance of roads and trails in or partly within the national forests, in cooperation with the State, Territory, or county, upon a basis equitable to both parties. This Federal participation already has resulted in a marked activity on the part of the States, until at the present time every State in the Union has succeeded in establishing some form of State highway department and is providing for some form of State aid or assistance to the local communities.

The public rural roads of the United States at present have a total length of 2,455,761 miles, of which about 287,000 miles, or 11.6 per cent, are improved with some form of surfacing. The mileage of hard-surfaced roads is increasing at the rate of about 15,000 miles per annum. During 1916 the States having State highway depart-

ments surfaced about 7,000 miles under State supervision and also improved an additional 9,000 miles by grading or otherwise. Thus, of the really constructive work of permanent improvement in the United States last year, about one-half was more or less directly under competent State supervision. In addition to this work of construction the several State highway departments also supervised the maintenance of 75,811 miles of main and trunk-line highways.

The expenditures in 1916 by or under the various State highway departments are shown in Table-I, and the work accomplished is shown in Table II. Table III shows the expenditure of State and local funds for the years 1904, 1914, and 1916. Figure 1 shows the distribution of the 1916 expenditures for construction, maintenance, engineering, administration, and miscellaneous items. The variations, especially in the items of administration and engineering, as shown in figure 1, probably are due more to differences in book-keeping and definition of what items should be included under these heads than to any other cause. There is a great need for a common standard, so that these items as reported by the several States may be fairly comparable. At present no fair comparison is possible without an exhaustive study to determine just exactly what items are included in each case.

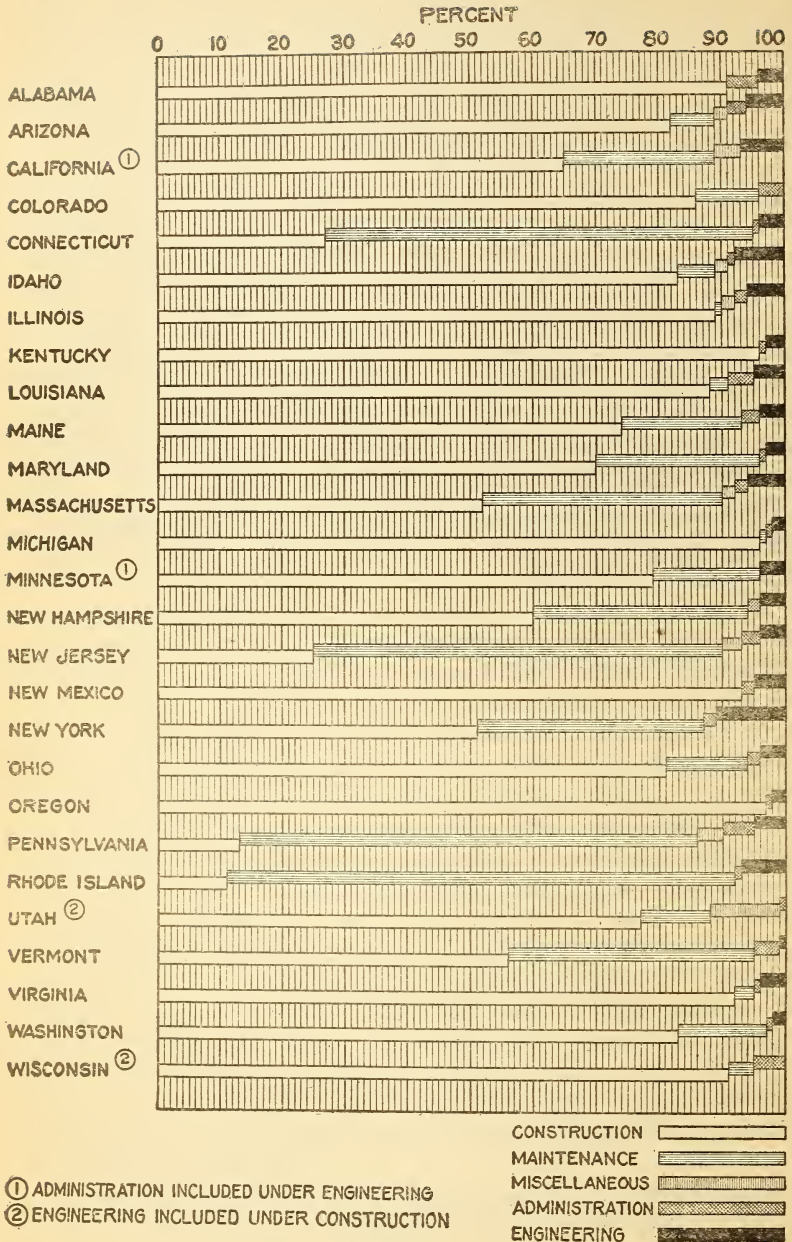


FIGURE 1.

TABLE I.—Expenditures during the year 1916 by or under the supervision of the State highway departments.

State.	Funds.		Total.	Construction.		Distribution of expenditures.				State funds available 1917 (approximate).	Local road and bridge expenditures, 1916, not under State highway department (approximate).
	State.	Local.		Bridges.		Maintenance, roads and bridges.	Engineering.	Administration.	Equipment and miscellaneous.		
				Roads.							
Alabama.....	\$102,122	\$83,962	\$186,384.00	\$157,257	\$12,747	\$28,130	\$7,150	\$9,230	\$10,469	\$200,000	\$1,000,000
Arizona.....	441,212		441,202.17	216,366	114,549		26,976	14,712		300,000	1,517,019
Arkansas.....	55,483	11,683,519	1,731,012.00	1,083,510	(2)		30,894	24,580		600,000	1,704,855
California.....	4,283,964		4,283,964.43	2,706,910		1,033,564	298,153	(3)	187,337	6,000,000	16,106,470
Colorado.....	607,628	662,829	1,270,456.59	851,979	2,455,610	126,110	(13)	46,767		750,000	1,042,751
Connecticut.....	1,855,918	855,000	1,950,947.83	377,574	151,469	1,315,028	79,713	19,756	7,407	2,000,000	1,250,000
Delaware.....	31,000		62,000.00	60,000				2,000		20,000,000	450,000
Florida.....	10,484		10,483.70				3,637	5,519	1,328	20,000	4,000,000
Georgia.....	348,061		448,718.00	281,956	92,072	27,534	33,976	6,080	6,500	750,000	3,750,000
Idaho.....	1,119,202	1,593,953	2,713,154.48	1,830,855	587,336	33,763	171,826	53,620	35,755	1,500,000	7,643,515
Illinois.....										400,000	13,500,000
Indiana.....	90,821		90,821.00				90,821	(3)		200,000	11,337,656
Iowa.....	10,000		10,000.00							(5)	5,600,000
Kansas.....	708,316	1,710,187	2,418,503.00	2,357,721	(2)	14,768	64,292	26,510	1,616	750,000	3,000,000
Kentucky.....	184,533	274,111	458,643.70	101,599			21,828	18,893	1,905	1,000,000	1,628,417
Louisiana.....	1,035,250	453,518	1,508,768.29	1,034,340	80,519	292,406	62,197	37,402	10,000	1,300,000	3,000,000
Maryland.....	2,590,000		2,590,000.00	1,500,000	300,000		70,000	30,000	10,000	3,950,000	3,350,000
Massachusetts.....	2,701,298	417,905	3,119,203.00	1,620,617		1,212,041	200,422	57,485	58,515	1,500,000	6,750,000
Michigan.....	882,699	2,340,000	3,222,693.00	3,100,000	9,101,176	16,324,69	56,738	30,849	12,007	1,500,000	3,975,192
Minnesota.....	1,390,525	3,376,550	4,767,075.79	2,865,381	4,891,353	793,254	(13)	6,500		10,000	3,250,000
Mississippi.....	6,500		6,500.00							700,000	3,400,000
Missouri.....	482,890	(5)	482,859.99	279,518		193,226	6,589	13,539	6,023	150,000	3,449,419
Montana.....	26,150		26,150.06							500,000	4,300,000
Nebraska.....	110,000	90,000	200,000.00		180,000		6,500	13,500		450,000	275,000
New York.....	411,699	440,712	845,410.18	481,512	21,473	284,224	30,853	21,039	3,300	1,200,000	1,200,000
New Hampshire.....	1,027,893	2,616,317	3,784,254.51	673,815	256,350	2,449,158	150,000	130,000	125,000	2,000,000	2,000,000
New Jersey.....	9,403,655	43,297	128,951.88	398,952	(2)		20,000	10,000		400,000	400,000
New Mexico.....		2,441,225	11,850,880.27	6,025,944		4,252,397	1,257,665	217,358	67,515	12,000,000	8,500,000
New York.....	10,000		10,000.00				(13)	10,000		10,000	10,000
North Carolina.....										200,000	2,711,295
North Dakota.....	2,885,071	3,107,551	5,992,621.88	4,336,404		748,778	266,464	137,741	3,248	3,800,000	7,000,000
Ohio.....	1,825,000	1,825,000	3,650,000.00	330,000	650,000		68,000	6,000	135,000	1,300,000	1,300,000
Oklahoma.....	165,062	230,000	455,061.47	151,691	290,000		7,327	7,244		500,000	5,500,000

For footnotes see page 6.

TABLE I.—Expenditures during the year 1916 by or under the supervision of the State highway departments—(continued).

State.	Funds.		Total.	Distribution of expenditures.					State funds available 1917 (approximate).	Local road and bridge expenditures, 1916, not under State highway department (approximate).	
	State.	Local.		Construction.		Maine- nance, roads and bridges.	Engineering.	Administra- tion.			Equip- ment and miscella- neous.
				Roads.	Bridges.						
Pennsylvania.....	\$3,663,357	\$322,040	1483,985,392.39	\$478,445	\$53,951	\$2,907,498	\$193,817	\$199,823	10 \$151,880	\$7,000,000	
Rhode Island.....	543,152		543,151.69		57,199	439,052	37,563	6,430	2,968	400,000	
South Carolina ⁶										30,000	
South Dakota ⁷										2,250,000	
Tennessee.....	200,000	400,000	600,000.00	350,000	25,000	170,000	30,000	25,000		4,000,000	
Texas ⁹										500,000	
Utah.....	179,400	725,760	905,160.00	607,700	88,130	96,310	(16)	11,300	101,720	10,500,000	
Vermont.....	632,800	250,000	882,800.00	454,200	44,000	340,000	9,600	35,000		650,000	
Virginia.....	542,524	1,348,725	1,891,248.75	1,586,874	163,679	1748,922	69,638	22,136		725,000	
Washington.....	859,672	2,104,340	2,964,012.71	2,442,158	(2)	424,529	67,037	30,288		1,800,000	
West Virginia.....	10,907		10,907.41				(13)	10,967		4,554,330	
Wisconsin.....	950,000	4,120,764	5,070,764.00	3,631,026	1,004,738	210,000	(13)	225,000		5,500,000	
Wyoming ⁶										1,500,000	
Total and average.....	40,909,001	33,526,553	74,495,554.29	41,409,824	18 5,414,331	18,452,861	18 3,656,705	18 1,572,292	920,554	60,010,000	
										198,138,859	

¹¹ Approximate, exact data not available.¹² Includes \$1,990,575 State aid to towns.¹³ Engineering included under administration.¹⁴ Does not include \$712,500.93 paid as cash bonus to second-class townships.¹⁵ Includes \$80,246.90 paid for purchase of toll roads.¹⁶ Included under construction.¹⁷ Includes \$13,592.37 for 14.77 miles of surface treatment.¹⁸ Partial totals.¹⁹ Does not include \$168,026 expended by the State department of engineering in improving²⁰ 72 miles and maintaining 561 miles of mountain road.¹ Local bond issues by highway districts.² Included under roads.³ Included under engineering.⁴ Includes culverts.⁵ State highway department established in 1917.⁶ General supervision of all highway work.⁷ State highway department educational and advisory.⁸ No data.⁹ On trunk line roads only.¹⁰ State reward funds to counties.

TABLE II.—Road mileage.

State.	Work done in 1916 under State supervision.			Total all State and State-aid roads built to Jan. 1, 1917.	Mileage of rural public roads.		
	State and State-aid roads built in 1916.	Roads maintained with State aid, 1916.	Number of bridges built by State or State aid, 1916.		Total all surfaced roads in State (approximate).	Total all public rural roads in State.	Percentage of surfaced roads in State.
	<i>Miles.</i>	<i>Miles.</i>		<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	
Alabama.....	³ 82	.....	4	659	6,000	55,446	10.8
Arizona.....	70	214	(⁹)	372	375	12,075	3.1
Arkansas.....	⁷ 380	.....	.....	534	1,500	50,743	3.0
California.....	256	1,153	.....	1,907	12,300	61,039	20.2
Colorado.....	¹⁰ 2,105	2,603	170	⁹ 7,805	1,800	39,780	4.6
Connecticut.....	⁵ 56	1,432	9	⁴ 1,627	3,100	14,061	22.0
Delaware.....	6	.....	.....	160	275	3,674	8.0
Florida.....	.....	.....	.....	.....	3,500	17,995	19.4
Georgia.....	.....	.....	.....	.....	13,000	80,669	15.3
Idaho.....	¹¹ 120	330	60	413	800	24,396	3.3
Illinois.....	¹² 299	278	449	767	12,400	95,647	13.0
Indiana.....	.....	.....	.....	.....	31,000	73,347	42.5
Iowa.....	.....	.....	.....	.....	1,000	104,074	1.0
Kansas.....	.....	.....	.....	.....	1,400	111,052	1.3
Kentucky.....	¹³ 811	.....	.....	1,611	13,400	57,916	23.2
Louisiana.....	¹⁴ 160	355	.....	752	2,400	24,563	9.8
Maine.....	¹⁵ 229	3,402	11	1,798	3,250	23,537	13.8
Maryland.....	95	1,450	12	1,821	2,900	16,459	17.6
Massachusetts.....	¹⁶ 192	1,100	(¹⁵)	1,998	8,900	18,681	47.6
Michigan.....	743	3,000	19	3,940	9,600	74,190	13.0
Minnesota.....	¹⁵ 3,769	12,704	¹⁷ 192	10,011	6,500	93,517	7.0
Mississippi.....	.....	.....	.....	.....	2,600	45,779	5.7
Missouri.....	(¹⁹)	9,000	.....	(¹⁹)	7,250	96,041	7.6
Montana.....	30	.....	127	30	800	39,204	2.0
Nebraska.....	.....	.....	7	.....	1,350	80,272	1.7
Nevada.....	.....	.....	.....	.....	320	12,182	2.6
New Hampshire.....	104	1,150	3	1,280	1,900	14,020	13.5
New Jersey.....	70	2,429	14	2,054	6,000	14,817	40.5
New Mexico.....	²⁰ 315	.....	74	846	550	11,873	4.6
New York.....	515	6,500	.....	6,765	18,000	79,398	22.7
North Carolina.....	.....	.....	.....	.....	6,750	50,788	13.3
North Dakota.....	.....	.....	.....	.....	1,100	68,796	1.6
Ohio.....	371	1,445	227	1,239	31,500	86,354	36.5
Oklahoma.....	1,900	²² 7,000	²¹ 2,100	1,900	300	107,916	3.3
Oregon.....	39	.....	22	413	4,875	36,819	13.2
Pennsylvania.....	²⁴ 248	9,171	24	1,988	10,500	91,556	11.4
Rhode Island.....	.....	305	4	325	750	2,170	34.5
South Carolina.....	.....	.....	.....	.....	3,700	42,226	8.8
South Dakota.....	.....	.....	.....	.....	750	96,306	3.8
Tennessee.....	150	500	7	150	8,750	46,050	18.9
Texas.....	.....	.....	.....	.....	12,000	128,960	9.3
Utah.....	² 586	3,440	136	3,440	1,500	8,810	17.1
Vermont.....	180	4,200	67	2,011	2,100	14,249	14.9
Virginia.....	²⁵ 700	.....	67	4,463	5,500	53,388	10.3
Washington.....	²⁶ 420	2,100	.....	1,977	5,900	42,428	13.9
West Virginia.....	.....	.....	.....	.....	1,532	32,024	4.7
Wisconsin.....	²⁷ 1,159	.....	²¹ 785	5,070	14,850	75,707	19.6
Wyoming.....	.....	.....	.....	.....	520	14,797	3.5
Total and average...	16,160	75,311	4,490	69,186	287,047	2,455,761	11.6

¹ Also 922 culverts.² Includes 428 miles of grading.³ Includes 14 miles of earth roads.⁴ Includes 195 miles of reconstruction.⁵ Includes 25 miles of reconstruction.⁶ 847 linear feet of bridges.⁷ Only engineering and supervision furnished by State. Includes 70 miles of earth roads.⁸ Includes 47 miles of earth roads.⁹ Includes about 6,300 miles of earth roads.¹⁰ Includes 1,810 miles of earth roads.¹¹ Includes 106 miles of earth roads.¹² Includes 56 miles of earth roads.¹³ Includes 275 miles of reconstruction and 70 miles of earth roads.¹⁴ Includes 64 miles of earth roads.¹⁵ Includes 11 miles of earth roads.¹⁶ Includes 52 miles of reconstruction.¹⁷ Also 2,330 culverts.¹⁸ Includes 2,186 miles of earth roads.¹⁹ No data.²⁰ Includes 181 miles of earth roads.²¹ Includes culverts.²² All earth roads.²³ All but 25 miles earth roads.²⁴ Includes 224 miles of resurfacing.²⁵ Includes 99 miles of earth roads.²⁶ Includes 110 miles of earth roads.²⁷ Includes 486 miles of grading.

TABLE III.—Cash road and bridge expenditures for the calendar years 1904, 1914, and 1916.

	Year in which first State-aid law passed.	State funds expended by or under State highway department.			Total cash expenditure from all sources.			Total State funds expended for road work from passage of law to Jan. 1, 1917.
		1904	1914	1916	1904	1914	1916	
Alabama.....	1911	.....	\$170,232	\$102,422	\$378,040	\$3,949,019	\$4,186,854	\$688,827
Arizona.....	1909	.....	.....	441,202	67,591	982,721	1,988,221	1,480,590
Arkansas.....	1913	.....	115,000	55,483	681,934	1,522,096	3,443,887	220,483
California.....	1895	\$11,251	.....	4,285,964	2,157,396	19,171,985	20,392,432	20,857,055
Colorado.....	1909	.....	301,274	307,623	635,395	1,937,546	2,313,208	1,632,379
Connecticut.....	1895	219,165	1,307,381	1,865,948	1,195,125	3,640,963	3,200,948	18,395,527
Delaware.....	1903	14,000	31,000	31,000	90,803	511,628	512,000	255,695
Florida.....	1915	.....	.....	10,484	437,184	2,230,255	4,010,484	11,619
Georgia.....	1908	.....	.....	.....	894,936	3,688,172	3,750,000	.....
Idaho.....	1905	49,812	.....	100,037	201,648	1,371,469	1,948,118	672,869
Illinois.....	1905	387,989	.....	1,119,202	3,844,424	8,734,713	10,356,669	2,805,829
Indiana.....	1917	.....	.....	.....	3,438,389	14,233,986	13,500,000	.....
Iowa.....	1904	.....	74,000	90,821	2,344,107	10,187,507	14,427,877	316,755
Kansas.....	1911	.....	9,080	10,000	692,823	5,544,048	5,610,000	40,000
Kentucky.....	1912	.....	18,000	708,346	1,161,194	2,474,621	4,448,533	1,325,061
Louisiana.....	1910	.....	161,186	184,533	345,452	1,77,572	3,458,642	790,860
Maine.....	1901	44,885	.....	1,055,250	1,472,393	2,12,007	3,167,215	6,920,459
Maryland.....	1898	.....	356,845	2,280,000	873,471	6,660,652	5,560,000	19,863,142
Massachusetts.....	1892	575,606	242,560	2,701,236	2,871,222	6,091,875	6,499,141	21,701,228
Michigan.....	1905	.....	657,264	982,939	1,816,504	9,261,998	10,082,939	4,165,640
Minnesota.....	1905	.....	1,309,956	1,390,525	1,607,417	6,458,940	8,742,278	5,678,699
Mississippi.....	1915	.....	.....	6,500	339,669	3,960,377	3,256,500	6,500
Missouri.....	1907	.....	277,253	482,860	1,570,801	5,513,409	7,982,860	2,274,032
Montana.....	1913	.....	13,516	26,150	308,744	2,888,400	3,475,569	60,496
Nebraska.....	1911	.....	.....	110,000	494,886	1,796,278	4,500,000	487,850
Nevada.....	1911	.....	.....	.....	46,876	245,014	275,000	20,000
New Hampshire.....	1903	44,000	491,520	414,669	872,606	1,590,464	2,045,410	3,674,458
New Jersey.....	1891	250,000	1,306,596	1,167,843	3,274,811	7,208,287	5,784,354	9,523,419
New Mexico.....	1909	.....	115,732	385,684	35,458	556,399	828,952	1,048,639
New York.....	1898	1,056,460	8,544,126	9,409,655	3,937,729	23,231,964	19,901,391	106,032,153
North Carolina.....	1901	.....	5,000	10,000	624,381	5,215,491	5,510,000	48,500
North Dakota.....	1909	.....	.....	.....	456,130	2,402,384	2,711,295	.....
Ohio.....	1904	.....	1,855,338	2,885,071	4,776,318	14,334,246	12,992,625	14,558,900
Oklahoma.....	1911	.....	.....	300,000	447,320	2,112,681	3,625,000	330,323
Oregon.....	1913	.....	10,697	165,662	649,718	5,310,467	5,955,662	584,637
Pennsylvania.....	1903	127,767	1,976,768	3,663,352	4,887,266	10,424,580	10,985,392	34,464,563
Rhode Island.....	1902	79,397	.....	543,152	376,812	446,496	943,152	4,450,936
South Carolina.....	1917	.....	.....	.....	334,082	1,024,480	1,250,000	.....
South Dakota.....	1911	.....	.....	.....	268,723	1,217,809	2,708,000	.....
Tennessee.....	1915	.....	.....	200,000	629,141	2,370,560	4,600,000	203,500
Texas.....	1917	.....	.....	.....	2,543,613	9,920,079	10,500,000	.....
Utah.....	1909	.....	157,732	179,400	158,286	803,071	1,855,160	989,132
Vermont.....	1898	127,381	458,456	632,800	567,397	1,023,941	1,607,800	4,304,864
Virginia.....	1906	.....	523,578	542,524	687,751	3,224,529	3,691,249	3,256,074
Washington.....	1909	.....	1,343,431	859,672	1,344,842	7,944,717	7,518,343	8,412,461
West Virginia.....	1905	.....	.....	10,967	587,870	2,483,747	5,510,967	1,141,945
Wisconsin.....	1911	.....	1,482,379	950,000	1,924,026	9,880,240	10,570,764	5,169,001
Wyoming.....	1911	.....	.....	.....	74,476	669,661	450,000	43,237
Total.....		2,549,850	24,220,850	40,969,001	59,427,180	240,263,784	272,634,424	307,937,838

¹ Of this \$118,000 was returned to the counties in 1911 by act of legislature.

